REMARKS

The above amendments to the specification, claims, and abstract have been made to place the application in proper U.S. format and to conform with proper grammatical and idiomatic English. None of the amendments herein are made for reasons related to patentability. No new matter has been added.

Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached page is captioned "**Version with markings to show changes made**".

In the unlikely event that the transmittal letter is separated from this document and the Patent Office determines that an extension and/or other relief is required, applicant petitions for any required relief including extensions of time and authorizes the Commissioner to charge the cost of such petitions and/or other fees due in connection with the filing of this document to **Deposit Account No. 03-1952** referencing docket no. 449122014700. However, the Commissioner is not authorized to charge the cost of the issue fee to the Deposit Account.

Respectfully submitted,

Dated: July 31, 2002

By: _____

Kevin R. Spivak
Registration No. 43,148

Morrison & Foerster LLP
2000 Pennsylvania Avenue, N.W.
Washington, D.C. 20006-1888
Telephone: (202) 887-6924
Facsimile: (202) 263-8396

VERSION WITH MARKINGS TO SHOW CHANGES MADE

For the convenience of the Examiner, the changes made are shown below with deleted text in strikethrough and added text in underline.

In the Specification:

Page 1 before the first paragraph, please delete the following:

~~Description~~

Page 1, between lines 4 and 5, please insert the following headings and paragraph:

CLAIM FOR PRIORITY

This application claims priority to International Application No. PCT/DE00/02429 which was published in the German language on July 18, 2000.

TECHNICAL FIELD OF THE INVENTION

Please replace the paragraph beginning at line 5 of page 1 with the following rewritten paragraph:

The invention relates to a device for a rail vehicle, and in particular, to a device for a rail vehicle having a control unit which determines a distance value specifying the distance of the rail vehicle from the ~~respectively provided,~~ next stopping point. ~~using a measured location measured value specifying the location of the rail vehicle and predefined, stored route data, determines the remaining time to the next stopping point using a measured time measured value specifying the respective time, and a predefined, stored timetable, and calculates a deactivation time taking into account the distance value which is determined, the remaining travel time which is determined, a speed measured value which specifies the speed of the rail vehicle and predefined coasting data which describe the coasting behavior of the rail vehicle when the drive is deactivated, starting from which deactivation time the rail~~

~~vehicle promptly reaches, in a non-driven fashion, the next stopping point which is respectively provided according to the timetable, while complying with the timetable, and an output device which is connected to the control unit, is actuated by it and generates a deactivation signal specifying the deactivation time.~~

Page 1, between lines 28 and 29, please insert the following heading:

BACKGROUND OF THE INVENTION

Please replace the consecutive paragraphs beginning at line 29 of page 1 with the following rewritten paragraphs:

~~Such a~~A device, ~~is known from~~ described in US patent 5,239,472, ~~and~~ is used to ~~make a saving~~ save ~~in~~ travel energy on rail vehicles. This device has, as a control unit, a microprocessor which determines the distance between the rail vehicle and the ~~respective~~ next stopping point with a location measured value which is sensed by an odometer and with route data which is stored in storage means.

Furthermore, the microprocessor determines, with a measured time measured value which indicates the respective time, and with a predefined, stored timetable, the travel time remaining to the rail vehicle until it reaches the next stopping point. With the distance value and the remaining travel time, the microprocessor then calculates, while taking into account the respective travel speed and the coasting behavior of the rail vehicle, ~~that~~ the point in time (referred to below as deactivation time) -- starting from which the rail vehicle can reach the ~~respective~~ next stopping point in non-driven fashion ~~-- that is to say~~ (i.e., by coasting or ~~in a braked fashion --~~ braking), while complying with the timetable.

An output device in the form of a display device is connected to the control unit. The display device is actuated by the control unit ~~in such a way~~ such that displaying the term

"coast" ~~it~~ signals ~~from which~~ a time which the drive of the rail vehicle can be switched off. In the ~~previously known~~ device, the route data and the predefined timetable are transmitted to the rail vehicle by a track-mounted computing unit before the rail vehicle is put into operation, and are permanently stored in said computing unit. The ~~previously known~~ device is therefore~~, in summary,~~ an energy-saving device which ~~indicates from~~ saves energy by determining at what time the next stopping point can be reached in accordance with ~~the~~ a timetable, and places the rail vehicle in a non-driven ~~fashion and thus without consuming energy~~ mode by utilizing the respective kinetic energy of the rail vehicle.

Page 2, between lines 29 and 30, please insert the following headings and paragraphs:

SUMMARY OF THE INVENTION

In one embodiment of the invention, there is a device of a rail vehicle. The device includes, for example, a computing unit which determines, in the rail vehicle, the distance between the rail vehicle and a stopping point using a measured location measuring value that specifies the location of the rail vehicle and predefined, stored route data, remaining travel time to the stopping point using a measured time measuring value which specifies the time and a predefined stored timetable, and a deactivation time in the rail vehicle based at least partially on the distance determined, the remaining travel time determined, a speed measured value specifying the speed of the rail vehicle and predefined coasting data which describes the coasting behavior of the rail vehicle when the drive is deactivated, starting from the deactivation time the rail vehicle reaches in a non-driven fashion the stopping point according to the timetable, and an output device which is connected to the computing unit, generate a deactivation signal which specifies the deactivation time, wherein the device has a data input at which a timetable modification variable can be input into the device, and the computing unit is configured such that, when a timetable modification variable is input, a modified

timetable is formed using the predefined, stored timetable and the timetable modification variable and determines the travel time remaining and the deactivation time based at least partially on the modified timetable, and the computing unit is configured such that it forms the modified timetable by adding the timetable modification variable to each predefined time information item of the stored timetable.

In another aspect of the invention, the computing unit is configured such that it determines the deactivation time while taking into account a predefined braking profile and a predefined minimum speed, during a downward transgression of which the rail vehicle is braked, in a phase of the non-driven travel toward the stopping point, in accordance with the predefined braking profile.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 shows a device of the present invention used for a rail vehicle.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

The invention relates to a device for a rail vehicle having a control unit which determines a distance value specifying the distance of the rail vehicle from the next stopping point. The device uses a measured location measured value specifying the location of the rail vehicle. Predefined, stored route data determines the remaining time to the next stopping point using a measured time measured value specifying the respective time. A predefined, stored timetable is also used to calculate a deactivation time, taking into account the distance value which is determined, the remaining travel time which is determined, a speed measured value which specifies the speed of the rail vehicle and predefined coasting data which describe the coasting behavior of the rail vehicle when the drive is deactivated, starting from which deactivation time the rail vehicle promptly reaches, in a non-driven fashion, the next

stopping point which is provided according to the timetable, while complying with the timetable, and an output device which is connected to the control unit, is actuated by it and generates a deactivation signal specifying the deactivation time.

Please replace the consecutive paragraphs beginning at line 30 of page 2 with the following rewritten paragraphs:

The invention ~~is based on the object of developing~~ discloses a device ~~of the type described at the beginning in such a way~~ such that a reliable saving in travel energy can be achieved with it even when there are operating faults.

~~This object is achieved according to the invention with a device of the type described at the beginning by virtue of the fact that t~~The invention has a data input at which a timetable modification variable can be input into the device, and the control unit is configured in such a way that, if a timetable modification variable is input, it forms a modified timetable with the predefined, stored timetable and the timetable modification variable which is input, and forms the remaining travel time and the deactivation time taking into account the modified timetable instead of the stored timetable.

An ~~essential~~ advantage of the device according to the invention is that the ~~latter also reliably specifies~~ correct time is specified for ~~the~~ switching off ~~of~~ the drive, even if it is not possible to comply with the timetable owing to operational faults ~~for~~. For example, ~~in the case of~~ faults such as track faults such as "congestion" on the route or in the case of failures of vehicles etc. The device according to the invention ~~specifically~~ has, in contrast to the ~~previously~~ known device, a data input at which a timetable modification variable can be input into the device ~~according to the invention with the result that~~. As a result, when there are operational faults, it is possible, for example, for timetable modifications to be input to the device by a track-mounted device, for example by radio. In order to process ~~this~~ the timetable

modification variable, the control unit of the device ~~according to the invention~~ is configured ~~in such a way~~ such that it forms a modified timetable with the predefined stored timetable and the timetable modification variable which is input ~~and forms the~~. The remaining travel time and the deactivation time of the drive are formed, taking into account ~~this~~ the modified timetable. ~~In summary, with t~~The device ~~according to the invention it is therefore possible to~~ takes into account changes in the timetable by feeding into the device a corresponding timetable modification variable ~~so that~~. Hence, in contrast to the ~~previously~~ known device, a saving in travel energy can be reliably obtained with the device ~~according to the invention~~ even when there are operational faults.

Another ~~A further significant~~ advantage of the device ~~according to the invention~~ is that, in order to input the changes in the timetable, only one timetable modification variable has to be input into the device~~; it~~. It is therefore not necessary to transmit a complete new timetable to the rail vehicle or to the device according to the invention.

This will now be explained with reference to an example~~: if~~. If a fault has occurred on a route – for example as a result of congestion on the route – the originally stored timetable can, under certain circumstances, no longer be complied with and it must be replaced by a new timetable. Because a timetable comprises a multiplicity of data, and thus a large quantity of data, this large quantity of data would generally have to be transmitted to the rail vehicle so that the device or the control unit can determine the deactivation time of the drive taking into account this new timetable. In the device according to the invention, the transmission of a complete new timetable data record is, however, not necessary because ~~with the device according to the invention~~ only a timetable modification variable has to be transmitted to the device. If it is possible to calculate at the track end – for example in the case of congestion – that the timetable is shifted by a total of approximately $\Delta t = +10$ minutes, a track-mounted device is used, for example, to merely transmit a timetable

modification variable of $\Delta t = +10$ minutes to the rail vehicle or to the device~~, according to the invention, and~~. A modified timetable is then formed in the device or in the control unit using the predefined, permanently stored timetable and the timetable modification variable of $\Delta t = +10$ minutes. The remaining travel time and the deactivation time for the drive is then formed in the control unit taking into account this modified timetable.

The modified timetable can be ~~particularly easily~~ formed in the control unit by adding the timetable modification variable to each individual predefined time information item of the stored timetable. ~~With this progression of the method according to the invention, t~~The timetable modification variable is added with the correct sign to the respective predefined time information item of the stored timetable~~; this ensures~~, ensuring that both changes to the timetable which bring about a prolongation of the travel time and changes to the timetable which cause a reduction in the travel time can be taken into account~~; this latter case~~,. This is significant, for example, if, contrary to the information specified in the stored timetable, the rail vehicle is to reach the ~~respective~~ next stopping point earlier than originally provided so that the route may be ~~is~~ cleared earlier than planned.

In order to achieve overall short travel times of the rail vehicle, it is generally necessary to avoid the rail vehicle coming to a standstill ~~exclusively~~ by coasting to the stopping point. ~~because specifically c~~Coasting at a very low speed can, under certain circumstances, take a long time. For this reason, the rail vehicle is generally braked according to a predefined braking profile when it reaches a minimum speed. In order to allow for this ~~fact~~, according to one ~~development~~ aspect of the device according to the invention, there is provision for the control unit to be configured ~~in such a way~~ such that it determines the deactivation time while ~~additionally~~ taking into account a predefined braking profile and a predefined minimum speed, on whose downward transgression the rail vehicle is braked in the phase of the non-driven travel toward the next stopping point in accordance with the

predefined braking profile. ~~In order to explain the invention, a figure shows an exemplary embodiment of a device according to the invention.~~

~~The f~~Figure 1 shows a device 5 for a rail vehicle (not illustrated) with a control unit 10 which is connected by its one input E10A to a measuring device 15. The measuring device 15 can be, for example, ~~what is referred to as~~ an odometer which determines the respective speed of the rail vehicle and the distance which has already been respectively covered, and thus the respective location S of the rail vehicle, using the revolutions of the wheels of the rail vehicle. At ~~further~~ another input E10B of the control unit 10, a timer in the form of a clock 20 which transmits the respective time t as a time measured value to the control unit 10 is arranged upstream of the control unit 10.

An additional input E10C of the control unit 10 is connected to ~~a~~ storage ~~means~~ 25 in which route data and a binding timetable for the rail vehicle are permanently stored. Furthermore, coasting data AD which describe the coasting behavior of the rail vehicle when the drive is deactivated are stored in the storage ~~means~~ 25~~; this~~. This coasting data AD can be, for example, deceleration values which have been measured in advance when the rail vehicle coasts, that is to say when the drive is deactivated.

Please replace the consecutive paragraphs beginning at line 38 of page 6 with the following rewritten paragraphs:

~~Finally t~~The measuring device 15 and the clock 20 are interrogated with the control unit 10~~; a~~. A location measured value S specifying the respective location of the rail vehicle, a speed measured variable V specifying the respective speed of the rail vehicle and a time measured value t specifying the respective time are transmitted to the control unit 10 here.

The control unit 10 subsequently reads the location S0 of the ~~respective~~ next stopping point and a scheduled arrival time t0 from the storage ~~means~~ 25 as route information or route

data~~; the~~. The scheduled arrival time t0 specifies here the time at which the rail vehicle should have reached the ~~respective~~ next stopping point. In addition, the control unit 10 interrogates the coasting data AD stored in the storage ~~means~~ 25.

The control unit 10 then tests whether a timetable modification variable Δt is present at its supplementary input E10D. The application of a timetable modification variable Δt to the supplementary input E10D can be carried out in different ways, with the result that the supplementary input E10D can be configured, for example, in such a way that a timetable modification variable Δt can be made electrically by means of a keypad input of the vehicle driver. Another method of inputting the timetable modification variable Δt could be for the timetable modification variable Δt to be fed into the computing unit 10 by radio – for example by means of a track-mounted device~~; this~~. This would then of course require corresponding receiving antennas at the supplementary input E10D of the computing unit.

Please replace the consecutive paragraphs beginning at line 38 of page 7 with the following rewritten paragraphs:

The control unit 10 subsequently forms a modified timetable by adding the timetable modification variable $\Delta t = + 10$ minutes to each individual predefined timetable information item stored in the storage ~~means~~ 25~~; this~~. This addition will now be explained by reference to the example of the scheduled arrival time t0, with which a modified scheduled arrival time t0' is formed according to:

$t0' = t0 + \Delta t$

Then, this modified scheduled arrival time t0', the location measured value S, the location S0 of the next stopping point, the speed V and the coasting data AD of the rail vehicle are used to determine a deactivation time from which the rail vehicle reaches the next stopping point

with the drive deactivated by using its kinetic energy and while keeping to the modified timetable.

In order to achieve short travel times of the rail vehicle overall, it is generally necessary to avoid the rail vehicle coming to a standstill at the stopping point ~~exclusively~~ as a result of coasting ~~because specifically under~~. Under certain circumstances, ~~the~~ coasting can take a long time at very low speeds. For this reason, the rail vehicle is generally braked in accordance with a predefined braking profile when a predefined minimum speed is downwardly transgressed. In order to allow for this fact, it is also possible to provide for the deactivation time in the computing unit 10 to be determined while additionally taking into account the predefined braking profile and the predetermined minimum speed.

The way in which the deactivation time can be determined using these input parameters – that is to say the scheduled arrival time t0', the location measured value S, the location S0 over the next stopping point, the speed V and the coasting data AD as well as, if appropriate, a possibly predefined minimum speed and a possibly predefined braking profile – can be found in detail in US patent 5,239,472 ~~mentioned at the beginning; the content of this US patent 5,239,472 is therefore a component of this description~~.

After the deactivation time has been determined, the control device 10 forms an actuation signal ST for the output device 30 ~~the~~. The output device 30 then generates a deactivation signal which specifies the deactivation time. This deactivation signal can be, for example as described in the ~~previously~~ known device, ~~explained at the beginning~~ a visual display which signals, by displaying the term "coast" that the coasting can be started~~; instead it~~. It can also be a display which displays or indicates the deactivation time visually and/or audibly in the form of time information.

In the Claims:

~~Patent Claims~~

What is claimed is:

1. (Amended) A device ~~(5)~~ of a rail vehicle ~~having~~, comprising:

a computing unit ~~(10)~~ which determines, in the rail vehicle, the distance between the rail vehicle and ~~the respectively provided, next~~ a stopping point using a measured location measuring value ~~(S) specifying the~~ that specifies a the location of the rail vehicle and predefined, stored route data~~, determines the remaining~~ travel time remaining ~~up~~ to the ~~next~~ stopping point using a measured time measuring value ~~(t)~~ which specifies the ~~respective~~ time and a predefined stored timetable, and ~~determines~~ a deactivation time in the rail vehicle ~~taking account of~~ based at least partially on the distance determined, the remaining travel time determined, a speed measured value ~~(v)~~ specifying the speed of the rail vehicle and predefined coasting data ~~(AD) which describe the~~ corresponding to coasting behavior of the rail vehicle when the drive is deactivated, starting from ~~which~~ the deactivation time the rail vehicle ~~promptly~~ reaches ~~in a non-driven fashion~~ the ~~next~~ stopping point ~~respectively provided~~ according to the timetable~~, while keeping to the timetable,~~; and

an output device ~~(30)~~ which is connected to the computing unit ~~(10)~~, ~~is actuated thereby and~~ to generates a deactivation signal which specifies the deactivation time, ~~characterized in that~~ wherein the device ~~(5)~~ has a data input ~~(E5)~~ at which a timetable modification variable ~~(Δt)~~ can be input into the device ~~(5)~~, and

the computing unit ~~(10)~~ is configured ~~in such a way~~ such that, ~~if~~ when a timetable modification variable ~~(Δt)~~ is input, a modified timetable is formed using ~~it forms with~~ the predefined, stored timetable and the timetable modification variable ~~(Δt) which is input, a modified timetable~~ and determines the ~~remaining~~ travel time remaining and the deactivation time ~~taking into account this~~ based at least partially on the modified timetable, and

the computing unit ~~(10) being~~ is configured ~~in such a way~~ such that it forms the modified timetable by adding the timetable modification variable ~~(Δt)~~ to each predefined time information item of the stored timetable.

2. (Amended) The device as claimed in claim 1, ~~characterized in that~~ wherein the computing unit ~~(10)~~ is configured ~~in such a way~~ such that it determines the deactivation time while ~~additionally~~ taking into account a predefined braking profile and a predefined minimum speed, ~~in the event of the~~ during a downward transgression of which the rail vehicle is braked, ~~in the phase of the non-driven~~ driving travel toward the ~~next~~ stopping point, in accordance with the predefined braking profile.

In the Abstract:

Please replace the Abstract with the substitute Abstract attached hereto.

ENERGY-SAVING DEVICE FOR A RAIL VEHICLE

Abstract

The invention relates to a device for a rail vehicle having a control unit which calculates a deactivation time starting from which the rail vehicle reaches a stopping point which is provided according to the timetable, while keeping to the timetable, using a location measuring value specifying the location of the rail vehicle, stored route data, a measured time value specifying the respective time, a stored timetable, a speed measured value specifying the speed of the rail vehicle and coasting data which correspond to the coasting behavior of the rail vehicle when the drive is deactivated. In order to save travel energy when there are operating faults, the invention provides for the device to have a data input at which a timetable modification variable can be input into the device, and that the control unit is configured such that it forms the deactivation time taking into account this timetable modification variable.